

CLAIMS

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Add B5

add C5

1. Influenza antigen, comprising a fusion product of at least the extracellular part of a conserved influenza membrane protein or a functional fragment thereof and a presenting carrier.

5 2. Influenza antigen, wherein the presenting carrier is a presenting (poly)peptide.

3. Influenza antigen, wherein the presenting carrier is a non-peptidic structure, such as glycans, peptide mimetics, synthetic polymers.

10 4. Influenza antigen as claimed in claims 1-3 further comprising an additional domain for enhancing the cellular immune response immunogenicity of the antigen.

5. Influenza antigen as claimed in claims 1-4, wherein the conserved influenza membrane protein is the

15 M2 membrane protein.

6. Influenza antigen as claimed in claim 5, wherein the M2 membrane protein originates from influenza A virus.

7. Influenza antigen as claimed in claims 1-6, 20 wherein the presenting (poly)peptide is selected from the hepatitis B core protein, one or more C3d domains, tetanus toxin fragment C.

8. Influenza antigen as claimed in claims 1-7, 25 wherein the antigen consists of Lactococci cells expressing the fusion product in or on their cell membrane, optionally said cells release said product.

9. Influenza antigen as claimed in claims 1-8, 30 wherein the functional fragment of the conserved influenza membrane protein is a fragment that is capable of eliciting a statistically significant higher immunoprotection when administered in an immunoprotective dose to test members of a species than is found in control members of the same species not receiving the functional fragment.

10. Influenza antigen as claimed in claims 1-9, wherein the additional domain is an influenza specific T helper cell epitope or cytotoxic T cell epitope.

11. Influenza antigen as claimed in claims 1-5 10, obtainable by preparing a gene construct comprising a coding sequence for at least the extracellular part of a conserved influenza membrane protein or a functional fragment thereof and at least one coding sequence for a presenting (poly)peptide operably linked thereto, 10 optionally in the presence of suitable transcription and/or translation regulatory sequences, bringing this gene construct in a suitable acceptor cell, effecting expression of the gene construct in the acceptor cell and optionally isolating the antigen from the acceptor cell 15 or its culture medium.

12. Influenza antigen as claimed in claim 11, wherein the coding sequence for the extracellular part of a conserved influenza membrane protein consists of a coding sequence for the extracellular part of the M2 20 protein of the influenza A virus or a functional fragment thereof and the coding sequence for the presenting (poly)peptide is selected from coding sequences for hepatitis B core protein, one or more C3d domains, or tetanus toxin fragment C.

25 13. Influenza antigen as claimed in claims 1-12, comprising the amino acids 2 to 24 of the M2 protein of influenza A virus, or modified versions thereof not substantially altering the tertiary structure of this part of the protein and hepatitis B core protein and/or 30 one or more C3d domains.

14. Influenza antigen as claimed in claims 1-13 for use in the preparation of a vaccine against influenza for humans and animals.

35 15. Influenza antigen as claimed in claims 1-14 for use in the preparation of a vaccine against influenza A for humans and animals.

16. Vaccine against influenza, comprising at least an antigen as claimed in claims 1-15, optionally in the presence of one or more excipients.

17. Vaccine as claimed in claim 16, wherein the antigen is in isolated form.

18. Vaccine as claimed in claim 16, wherein the antigen is part of a membrane fragment.

19. Vaccine as claimed in claim 16, wherein the antigen is anchored in the membrane of an acceptor cell expressing the antigen.

20. Vaccine as claimed in claim 16, wherein the antigen consists of Lactococci cells expressing the fusion product in or on their cell envelope.

21. Vaccine as claimed in claims 16-20, further comprising one or more other influenza antigens, for example selected from hemagglutinin, neuraminidase nucleoprotein and/or native M2.

22. Use of an antigen as claimed in claims 1-13 for the preparation of a vaccine against influenza.

23. Method of preparing an antigen as claimed in claims 1-15, comprising the steps of:

a) preparing a gene construct comprising a coding sequence for at least the extracellular part of a conserved influenza membrane protein or a functional fragment thereof and at least one coding sequence for a presenting (poly)peptide operably linked thereto, optionally in the presence of suitable transcription and/or translation regulatory sequences,

b) bringing this gene construct in a suitable acceptor cell,

c) effecting expression of the gene construct in the acceptor cell, and

d) optionally isolating the antigen from the acceptor cell or its culture medium.

24. Acceptor cell, expressing an antigen as claimed in claims 1-15.

25. Acceptor cell as claimed in claim 24, wherein the cells are Lactococcus cells.